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Preface

The Faculty of Animal Science, Universitas Jenderal Soedirman, Purwokerto organized the Animal Science and Technology Conference Series (ANSTC 2019) on 6-8 August 2019 in Purwokerto, Central Java, Indonesia. The ANSTC 2019 aims to exchange knowledge and research finding among academicians, researchers, profesionals, policy makers, and postgraduate students.

The countries in the tropics have a variety of local animals playing an important role and being extensive industry prospects. The ANSTC 2019 seeks to raise the question on how to develop animal industries for sustainable rural and environmental development facing the era of Industry 4.0. The right perspective on challenges and opportunities have been discussed under the themes: 1) General animal production and husbandries (ruminants and non-ruminants), 2) Post-harvest handling and processing of meat, milk, eggs, wools, and by-products, 3) Emerging and prospective animals, 4) Animal biotechnology, 5) Animal health, diseases, and welfare/ethics, 6) Edu-tourism and ecotourism involving animals, 7) Feeds, feeding, and animal nutrition, 8) Animal physiology, reproduction, and breeding/genetics, 9) Halal aspects of animal products, 10) Environmental issues of animal farming, and 11) Other aspects related to animal science and technology.

ANSTC 2019 was attended by 125 participants, and a total of 83 papers were presented and discussed. The papers were authored by researchers from Australia, Timor Leste, Malaysia, The Philippines, Thailand, and Indonesia. All papers have been scrutinized by a panel of reviewers who provide critical comments and corrections, and thereafter contributed to the improvement of the quality of the papers. Based on the reviewer's reports, 72 papers were selected and eligible to be published in the proceeding and 11 papers were assigned for further submission to the Journal of Animal Production, the scientific journal accredited by DGHE of Indonesia (S2).

We sincerely express our gratitude to the international/national advisory committee, presenters, organizing committee members, session chairs, the Dean and all members of the Faculty of Animal Science Jenderal Soedirman University, student volunteers, participants, contributors and all the members ANSTC 2019. Last but not the least, we are thankful to IOP JPCS for producing the proceeding.

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The Potential Breeding Dans of Cattle at Different Age Based on Body Weight, Chest Circumference and Body Condition Score of Kebumen "Peranakan Ongole" (Po) Cattle in "Urut Sewu" Breeding Areas

A R Rofikoh[1], M Y Sumaryadi[1] and A Setyaningrum[1]

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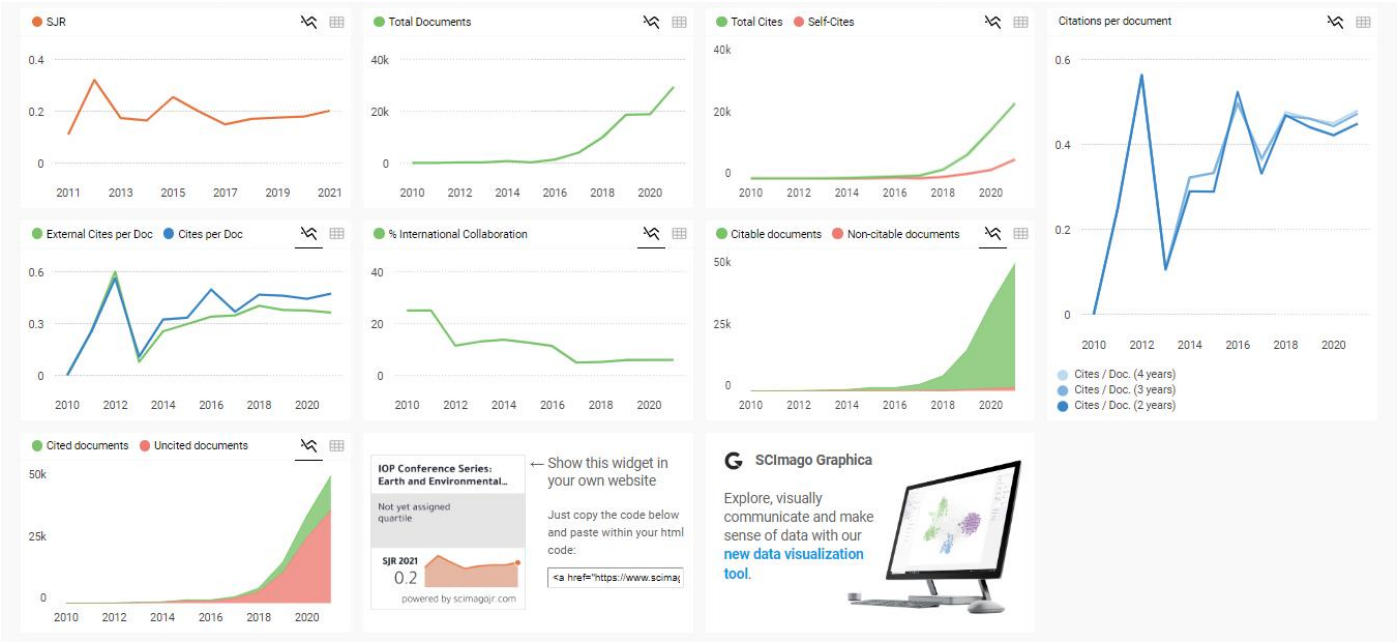

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The Potential Breeding Dans of Cattle at Different Age Based on Body Weight, Chest Circumference and Body Condition Score of Kebumen "Peranakan Ongole" (Po) Cattle in "Urut Sewu" Breeding Areas

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Abstract. This research was aimed to determine the potential breeding dans of cattle at different age based on body weight (BW), chest circumference (CC) and body condition score (BCS) of 440 cattle from 29 breeding groups in Urut Sewu which included Mirit subdistrict, Ambal, Bulus pesantren, Klirong, Petanahan, and Puring subdistrict. The study applied a survey method allocating two age groups: U1= 18 – 24 months and U2 = >24 – 36 months. The observed variables were BW, CC and BCS. The collected data were subject to an Independent sample test (t-test). The result showed a highly significant difference (P<0.01) between U1 and U2. The average BW, CC, and BCS of Kebumen "Peranakan Ongole" (PO) cattle in U1 were 306.04 ± 67.86 kg, 153.99 ± 11.74 cm and 3.18 ± 0.41, respectively, and in U2 were 368.00 ± 97.79 kg, 163.10 ± 14.38 cm and 3.48 ± 0.58, respectively. The body condition score of Kebumen PO cattle was higher than in the Indonesian National Standard (SNI); therefore, PO cattle had an improved grade as potential germ plasm of indigenous cattle in Indonesia.

Keywords: Peranakan Ongole (PO), age, body weight (BW), chest circumference (CC), body condition score (BCS)

1. Introduction

One of the main targets of livestock development is to accomplish a sustainable animal protein sufficiency and to reduce import [1]. According to Indonesian Association of Beef Cattle Stakeholder [2] meat demand in 2018 reached 662.540 ton, 64.19% of which (429.410 ton) was domestic production and the rest 35.81% (233.130 ton) was the imported feeder cattle and beef. It indicated that sustainable beef production in national level is possible when the population of indigenous cattle meets the regulated demand.

Population of cattle in Central Java reached 51.93% was Kebumen PO Cattle [3]. Kebumen is an enclave of PO cattle breeding; therefore, the cattle is known as Kebumen "Peranakan Ongole" (PO) cattle. Furthermore, a Ministerial Decree of the Minister of Agriculture Republic of Indonesia No.358/Kpts/PK.040/6/2015 stipulated the breed of Kebumen "Peranakan Ongole" (PO) cattle. The breeding needs to be preserved because the biggest threat to indigenous cattle in Indonesia is the declining genetic quality due to uncontrolled mating and selection patterns. Accordingly, the quality of

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Kebumen PO cattle is maintained through breeding selection by investigating the potential breeding dans at different age based on BW, CC and BCS.

2. Methodology

The materials for this study were Kebumen PO cattle in each subdistrict of Urut Sewu (30% of the total population) aged 18 – 36 months, and the equipment included a stick and a measuring tape. A survey was designed to collect data on cattle BW, CC, and BCS, and a direct interview with the farmers using a list of questionnaire was conducted to gather data on farmers' characteristics and the livestock management. All selected cattle were allocated into two age groups: U1 = 18 – 24 months and U2 = >24 – 36 months, each was subject to an unequal replicate. The measured parameters were BW, CC, and BCS based on palpation of subcutaneous fat deposit around the tail base.

a. BW was determined from the estimated CC in kg.
b. CC was measured by wrapping the measuring tape around the chest behind the hump in cm.
c. BCS was determined based on the scale 1 to 5 following the procedure of measuring beef cattle in the Centre of Agriculture Technology Research NTB 2010.

The collected data were subject to unequal t-test. The farmers' characteristics, management, health, reproduction, and sanitation were subject to descriptive analysis.

3. Result and Discussion

The results of the average BW, CC, and BCS of Kebumen PO cattle in two age groups are presented in **Table 1**.

Table 1. The average Body Weight (BW), Chest Circumference (CC) and Body Condition Score (BCS) of Kebumen PO cattle

Parameter	Age groups (months)	
	18 – 24	>24 – 36
Body weight (kg)	306.04 ± 67.86^{a}	368.00 ± 97.79^{b}
Chest circumference (cm)	153.99 ± 11.74^{a}	163.10 ± 14.38^{b}
BCS	3.18 ± 0.40^{a}	3.48 ± 0.57^{b}

[ab)] Values bearing different value within line showed a highly significant difference ($P<0.01$)

Table 1 shows that BW, CC, and BCS of Kebumen PO cattle are highly significantly different ($P<0.01$) between U1 and U2. Body weight (BW) of U2 Kebumen PO cattle was significantly ($P<0.01$) higher than that of U1. It indicated that growth was linear to age and an important factor in cattle productivity. [4] stated that cattle BW is one of the contributing factors to breeding selection and BCS.

The average BW of Kebumen PO cattle aged U1 and U2 was 306.04 ± 67.86 kg and 368.00 ± 97.79 kg, respectively, and it was higher than a study by [5] namely 250.55 ± 96.05 kg and 349.91 ± 62.65. Genetic and environment are the main factors in cattle growth and development. A controlled mating pattern – natural mating with male or artificial insemination which produce offspring with optimum quantity and quality [1].

The result of chest circumference (CC) of cattle aged U2 was significantly ($P<0.01$) higher than that of U1. The average CC was linear with the BW of Kebumen PO cattle because BW was measured from the estimated CC. Cattle growth and development were signified by the changing body composition, i.e., the increasing BW and CC [6].

The average CC of Kebumen PO cattle aged U1 and U2 was 153.99 ± 11.74 cm and 163.10 ± 14.38 cm respectively. This result was higher than the Grade I of SNI: 138 cm and 161 cm respectively. Therefore, based on the CC, Kebumen PO cattle had a higher than grade I of SNI. Similarly, this result was higher than [7] of cattle aged U2 were 151.8 ± 10.2 cm, 157.1 ± 12.5 cm and 155.9 ± 6.7 cm of PO cattle in Tuban district, Lamongan and Blora district, respectively. Accordingly, the morphometric of Kebumen PO cattle showed its potential as the alternative breeding source of Kebumen PO cattle.

According to [8], the technical parameter to determine cattle breed could be estimated from body condition; as such, BW was estimated from body length (BL) and CC.

Body condition score (BCS) is a method to calculate cattle body condition by visual assessment or palpation of subcutaneous fat deposit around the tail base. BCS is correlated with Service per Conception (S/C); however, the study did not include S/C because it was not involved in breeding selection (SKLB). In contrast, [9] reported that S/C relation to BCS 2, 3 and 4 was 1.06 ± 0.25, 1.06 ± 0.24 and 1.18 ± 0.43, respectively. According to [10], an optimum S/C value was 1.5 – 2.0. The result of BCS analysis on Kebumen "Peranakan Ongole" cattle showed that BCS at U2 was highly significantly ($P<0.01$) higher than that of U1. The average of BCS at U1 and U2 was 3.18 ± 0.41 and 3.48 ± 0.57, respectively. Based on a study by [9], it is estimated that the selected Kebumen PO cattle had an S/C value under 2. Despite the optimum BCS, S/C is also affected by low-motility semen; poor maternal condition due to genetic and environmental factor; improper estrous detection; and the inseminator skills [11].

As the cattle get older, BCS is higher because BCS is closely related to the reproduction system that includes fertility, gestation, calving, and lactation [9]. Hidayat et al. [12] stated that the low S/C on Kebumen PO cattle was due to poor maintenance system where farmers offered average feed such as rice husk and forage without fortified concentrate and mineral; therefore it negatively affects BCS and the estrous cycle.

4. Conclusion

Body weight, chest circumference and body condition score of Kebumen PO cattle were higher than those in SNI or previous studies; therefore, the present study showed that Kebumen PO cattle exhibit an improved grade in both quality and quantity. Kebumen PO cattle are the potential indigenous cattle breeding from Indonesia based on the body condition.

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